

REMARKS

A. Status of the Claims

In the Office Action of September 24, 2007, the status of the claims was:

Claims 1-31 were provisionally rejected on the ground of obviousness-type double patenting.

Claims 15, 16, 20, 21, 26, 28 and 29 were rejected under 35 U.S.C. §102(a) or, alternatively, under 35 U.S.C. §103(a) based on four technical publications.

Claims 1-7 were rejected under 35 U.S.C. §103(a) based on the same four technical publications referred to above.

In this Amendment and Response, all of the pending Claims 1-31 have been canceled. New Claims 32-55 have been submitted. New claims 32-55 focus on a particular embodiment of the invention disclosed in the application, namely on the method of preparing chemically-doped boron using a novel vapor-phase process as disclosed in the application. No new matter has been added. The subject matter of new Claims 32-55 is clearly supported by the original disclosure, for example at page 3, line 16 to page 5, line 3, and by Examples 1, 2 and 3 of the Specification. As discussed below, this invention embodiment is considered distinct from the magnesium diboride embodiment of the invention as represented by the claims of the related patent application, U.S. Serial No. 10/989,803, now U.S. Patent No. 7,294,606.

Reconsideration and withdrawal of the outstanding rejections is respectfully requested in view of the cancellation of Claims 1-31, the submission of new Claims 32-55, and the following Remarks.

B. The Provisional Obviousness-Type Double Patenting Rejection

On page 2 of the Office Action, Claims 1-31 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claims 1, 4-7, 10-12, 16 and 17 of copending U.S. patent application Serial No. 10/989,803. Since the date of the Office Action, Serial No. 10/989,803 has issued as U.S. Patent No. 7,294,606. The allowed claims were renumbered in the issued patent.

However, Applicant respectfully requests that this ground of rejection now be reconsidered and withdrawn in view of the cancellation of Claims 1-31, the submission of new claims 32-55, and the following Remarks.

First, all of the claims that were provisionally rejected on double patenting (Claims 1-31) have herein been canceled. New claims 32-55 submitted herewith are directed to a different embodiment of the subject invention, an embodiment which is distinguishable from the invention embodiment that is claimed in U.S. Patent No. 7,294,606 (the Suplinskas '606 patent).

More specifically, independent method Claim 1 of the Suplinskas '606 patent recites the method step of "exposing the doped boron to magnesium vapor to convert the doped boron to doped magnesium diboride." Independent product Claim 4 of the Suplinskas '606 patent correspondingly recites the product-by-process step of "exposing the doped boron to a magnesium vapor." By contrast, none of the new Claims 32-55 submitted with this Amendment and Response recites, expressly or implicitly, or in any way implies or requires, a process step of "exposing the doped boron to a magnesium vapor."

Although method Claim 1 of the Suplinskas '606 patent (which recites the step of "exposing the doped boron to magnesium vapor") was allowed, in the present application Claim 1 (a method claim generally corresponding to Claim 1 of the Suplinskas '606 patent but without the step of "exposing the doped boron to magnesium vapor") was rejected on prior art grounds. This difference in treatment of these two otherwise similar claims suggests that the Patent Office recognizes a patentable distinction between a claim that recites the step of "exposing the doped boron to magnesium vapor" and a claim that does not include such a recitation.

Second, Applicant respectfully calls the Examiner's attention to the fact that the Suplinskas '606 patent is based on Divisional patent application Ser. No. 10/989,803, which in turn was based on international application PCT/US03/20628, filed July 1, 2003. The present application is a Sec. 371 application which is also based on the same international application PCT/US03/20628. Accordingly, even in the absence of a terminal disclaimer, the normal expiration dates of two patents based on the same international application would be the same.

For all of these reasons, Applicant respectfully requests that the earlier provisional double-patenting rejection be reconsidered and withdrawn.

C. Prior Art Rejections

At the top of page 3 of the Office Action, Claims 15, 16, 20, 21, 26, 28 and 29 were rejected under 35 U.S.C. §102(a) as being anticipated by any of the four cited

technical articles by Feng et al., Kuzmann et al., Cardwell et al., or Toulemonde et al. In the alternative, the Examiner also rejected these claims under 35 U.S.C. §103(a) as being obvious over these same four articles. Also on page 3 of the Office Action, Claims 1-7 were rejected as being obvious over the same set of four technical publications.

The Examiner explained the relevance of these four technical references by stating: “All of the articles disclose superconductors comprising doped magnesium diboride.”

All of the claims rejected on these prior art grounds have now been canceled. None of the new Claims 32-55 recites or is directed to “superconductors.” Also, none of the new Claims 32-55 recites or results in the preparation “magnesium diboride.” Instead, all of the new claims are clearly directed to a vapor-phase process of preparing chemically-doped boron, which may have applications in preparing superconductors, but which also has other important commercial uses.

By contrast, none of the cited publications teaches or suggests a vapor-phase process, and all of these publications are directed only to preparing magnesium diboride superconductors. For example, the Kuzmann article teaches: “The superconductor samples were prepared by solid reaction from powders of magnesium, amorphous boron, iron and cobalt,” (page 1479 – emphasis added).

The Feng et al. article teaches preparing Zr-doped MgB₂ bulk samples “by the solid-state reaction at ambient pressure,” (page 2615 – emphasis added).

The Toulemonde et al. article teaches: “The most common [preparation] method [of preparing MgB_2] is based on the reaction between a fine powder of boron and liquid magnesium in equilibrium with its vapour above the melting point of Mg,” (page 2 – emphasis added).

The Cardwell et al. article teaches that: “Cylindrical pellets composed of MgB_2 ... were prepared from a mixture of high purity Mg, B, Ag, Cu and Zn powders using an evacuated press die-set to minimize the air trapped in the sample,” (page 1262 – emphasis added). All of these publications are clearly directed to solid-state, not vapor-phase, processes.

Furthermore, none of the cited articles teaches or suggests using titanium (Ti), silicon (Si) or carbon (C) as dopants in preparing chemically-doped boron or (with one exception) even in magnesium diboride. One reference, Feng et al., teaches that studies have found mixed results in using Ti-doped magnesium diboride (page 2615). While one paper reported “a deleterious effect of Ti doping,” another study suggested that “a suitable amount of Ti doping will increase J_c in MgB_2 .” Both of these studies, however, concerned Ti-doped MgB_2 for superconductor applications, not Ti-doped boron.

Additionally, none of the cited articles teaches or suggests the specific vapor-phase processes now recited in the claims for preparing chemically-doped boron – for example, the step of bubbling hydrogen gas through a container of liquid titanium tetrachloride or methyltrichlorosilane to vaporize or entrain these dopant-containing materials in the hydrogen stream going to the reactor.

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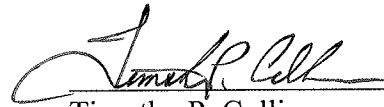
For all of these reasons, Applicant respectfully submits that new Claims 32-55 are not anticipated by or obvious in view of the four cited technical publications.

SUMMARY AND CONCLUSIONS

Accordingly, for all of these reasons, Applicant respectfully submits that Claims 32-55 now pending in this application are in condition for allowance, and an early notification thereof is earnestly requested.

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